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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 09/871,563  | 05/31/2001  | Nitin Kasturi        | 000012              | 1122             |
| 23696   | 7590        | 12/28/2004           | EXAMINER            |                  |
| Qualcomm Incorporated<br>Patents Department<br>5775 Morehouse Drive<br>San Diego, CA 92121-1714 |             |                      | PHAN, MAN U         |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      | 2665                |                  |

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 09/871,563             | KASTURI ET AL.      |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | Man Phan               | 2665                |  |

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-21 is/are allowed.
- 6) ☒ Claim(s) 1-13 and 22-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>06/24/03</u> .  | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

1. The application of Kasturi et al. for a "Method and apparatus for W-CDMA modulation" filed 05/31/2001 has been examined. Claims 1-35 are pending in the application.

#### ***Claim Rejections - 35 USC ' 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 1038 and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 3-6, 22, 24, 26, 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belaiche (US2001/0021229) in view of Lim et al. (US#6,182,265).

With respect to claims 1, 3-6 and 22, 24, Belaiche (US2001/0021229) disclose a novel system and method for matching at least two transport channels on the composite channel, according to the essential features of the claims. Belaiche discloses in Fig. 1 a block diagram illustrated the chain used to generate a composite channel in a downlink, in which concatenation/code block segmentation at step 106, each of the code blocks are individually subjected to channel coding 108 and rate matching 116 according to the puncturing and incremental redundancy used. The blocks are then subject to physical channel segmentation 128, and interleaving 130, and physical channel mapping 132, where physical channels 1 through K are output (See also Fig. 7; page 1, para. [0015] plus, and page 4, para, [0053] plus). Furthermore, the channel coding model for High Speed Downlink Packet Access (HSDPA) operates accordance with the 3GPP specification protocols of section 4.2, "Technical Specification Group Radio Access Network; Multiplexing and Channel Coding (FDD) (Release 1999)", TS 25.212 v3.5.0 (2000-12). The detailed functionality, and the transport channel procedure of the 3G WCDMA system is defined in 3GPP TS 25.212. Within the International Telecommunications Union (ITU), WCDMA is the main third generation air interface. There are two channel interleavers for 3G WCDMA, namely first and second interleavers. The first interleaver takes a role of inter-frame (in transport channel) interleaving and the second interleavers for intra-frame (in physical channel) interleaving [3GPP TS 25.212 v3.9.0 (Mar. 2002) Technical Specification, 3.sup.rd Generation

*Partnership Project; Technical Specification Group Radio Access Network; Multiplexing and channel coding (FDD) (Release 1999), pp. 1-62].*

However, Belaiche does not disclose expressly the use of encoder RAM in channel coding and interleaving processes. In the same field of endeavor, Lim et al. discloses a method for encoding a channel using a parallel convolutional encoder which is capable of inputting data into a frame input data register and, at the same time, encoding the data using a parallel convolutional encoder and processing an interleaving operation using two interleaver RAMs without using a frame input data buffer RAM for decreasing the number of RAM control logic hardware of a channel encoder and implementing a simple protocol when changing a micro controller and a frame input data packet by overcoming the problems encountered in the conventional art which uses a RAM storing a frame data and another RAM interleaving a code symbol which is an output from the convolutional encoder when implementing a channel encoder using a convolutional encoding and interleaving operation (See Fig. 1; Col. 2, lines 33 plus).

Regarding claims 28-30, they are method claims corresponding to the apparatus claims 1, 3-6 above. Therefore, claims 28-30 are analyzed and rejected as previously discussed with respect to claims 1, 3-6.

Regarding claim 22, it's a system claim corresponding to the method and apparatus claims above. Therefore, claim 22 is analyzed and rejected as previously discussed with respect to claims 1, 3-6 and 28-30.

One skilled in the art would have recognized the need for effectively and efficiently encoding transport channels according to a modulation and coding scheme in WCDMA

communication system, and would have applied Lim's novel use of encoder RAM in in encoding and interleaving operation into Belaiche's method for matching transport channels within a composite channel in 3GPP. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Lim's method for encoding a channel using a parallel convolutional encoder into Belaiche's method for matching transport channels within a composite channel, corresponding devive and base station with the motivation being to provide a multiplexing/coding chain for use in WCDMA modulation.

5. Claims 2, 7-13, 22, 25, 27 and 31-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Belaiche (US2001/0021229) in view of Lim et al. (US#6,182,265) as applied to the claims above, and further in view of Imura (US2001/0014113).

With respectto claims 2, 7-13 and 23, 25, Belaiche and Lim disclose the claimed limitations as discussed in the paragraph 4 above. However, the claims further require the use of channel coder and interleaver in channel coding and interleaving processes. In the same field of endeavor, Imura (US2001/0014113) teaches a configuration of a 3GPP specification uplink/downlink for DPCH. As shown in Fig. 6, a cycle redundant check (CRC) processes the bit sequence and produces the CRC attached bit sequence b. A transport block (TrBk) concatenation and code block segmentation is performed before channel coding and produces o. Channel coding block produces encoded bits c. Radio frame equalization produces sequence t. There is a first interleaver whose output d is processed by radio frame segmentation and rate matching producing sequences e and f, respectively. Next, transport

channel (TrCH) multiplexing produces a sequence  $s$ , which is a coded composite transport channel (CCTrCH). Next, physical channel segmentation produces sequence  $u$ , which is transmitted through a second interleaver to produce sequence  $v$ . Finally, physical channel mapping is performed to produce physical channels PhCH (Page 5, para. [0069] – [0078]).

Regarding claims 31-35, they are method claims corresponding to the apparatus claims 2, 7-13 above. Therefore, claims 31-35 are analyzed and rejected as previously discussed with respect to claims 2, 7-13.

Regarding claim 27, it's a system claim corresponding to the method and apparatus claims above. Therefore, claim 27 is analyzed and rejected as previously discussed with respect to claims 2, 7-13, 23, 25 and 31-35.

One skilled in the art would have recognized the need for effectively and efficiently encoding transport channels according to a modulation and coding scheme in WCDMA communication system, and would have applied Imura's configuration of a 3GPP specification uplink/downlink for DPCH and Lim's novel use of encoder RAM in in encoding and interleaving operation into Belaiche's method for matching transport channels within a composite channel in 3GPP. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Imura's diffusion code generator, CDMA communication apparatus using the same, and diffusion code generating method used therefor, and Lim's method for encoding a channel using a parallel convolutional encoder into Belaiche's method for matching transport channels within a composite channel, corresponding device and base station with the motivation being to provide a multiplexing/coding chain for use in WCDMA modulation.

***Allowable Subject Matter***

6. Claims 14-21 are allowable.

The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest the combination of a concatenator for reading transport blocks from the first memory, removing bits not intended for transmission from the read transport blocks, and storing the concatenated transport blocks in the second memory; a channel coder for coding the transport channels from the second memory, wherein the coding of subsets of the transport channels can be repeated; and an interleaver for receiving the coded transport channels and selecting subsets of each coded transport channel and the repeated coded transport channels to produce a coded, interleaved data stream, as specifically recited in the claims.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Ostman (US#6,738,370) is cited to show the method and apparatus implementing retransmission in a communication system providing H-ARQ.

The Tong et al. (US#6,744,744) is cited to show the rate matching and channel interleaving for a communications system.



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The Secord et al. (US#6,373,831) is cited to show the systems and methods of channel coding and inverse multiplexing for multi carrier CDMA system.

The Lundsjo et al. (US#6,473,442) is cited to show the communications system and method for matching and balancing the bit rates of transport channels to the bit rate of a physical channel.

The Sipola (US2002/0044612) is cited to show the interleaving method and system.

The Hladik et al. (US#5,721,745) is cited to show the parallel concatenated tail biting convolutional code and decoder therefor.

The Dabak et al. (US2004/0180627) is cited to show the CDMA wireless system with closed loop mode using ninety degree phase rotation and beamformer verification.

The Yu et al. (US2003/0066018) is cited to show an apparatus and method for stopping iterative decoding in a CDMA mobile communication system.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (571) 272-3149.

The examiner can normally be reached on Mon - Fri from 6:00 to 3:00 EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

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9. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:** (703) 305-9051, (for formal communications intended for entry)

**Or:** (703) 305-3988 (for informal or draft communications, please label

"PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive,  
Arlington, VA., Sixth Floor (Receptionist).

Mphan

12/20/2004.

A handwritten signature in black ink, appearing to read "Man U. Phan". The signature is stylized with a large, looped "P" and a long horizontal stroke.

MAN U. PHAN  
PRIMARY EXAMINER